Gigahertz Optical Data Transmitters for Laser Communications, Phase I

Completed Technology Project (2006 - 2006)

Project Introduction

Wireless optical communication systems have gone through considerable development in the past few years, as optical components have experiences important technologic advances and price decreases. Thus data communications are increasingly using wireless optical systems at higher speeds. These systems are being used as an alternative to cabled media, mainly due to their simpler deployment and reconfiguration. The high data rate and large information throughput available with laser communication are many times greater than in RF systems, furthermore WDM technology can also be used in free space laser communication system. To provide optical wireless communication between crew and the base of NASA advanced extravehicular activity (EVA) systems, Boston Applied Technologies Incorporated (BATI) proposes an innovative laser communication system based on our recent breakthrough of high performance light intensity and polarization management devices. The laser communication devices developed at BATI have the advantage of significantly reduced size and complexity, small power consumption, high extinction ratio, and solid-state ruggedness. Rather than using two laser transmitters, the proposed laser communication system can establish a two-way optical link using a single conventional laser transmitter.

Anticipated Benefits

Potential NASA Commercial Applications: A similar system can provide a communication link between a satellite and the ground. The success of this program will have great impacts in military, space, industrial, and consumer sectors. The proposed system may provide a viable approach for the "the last mile" application.

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Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Center / Facility:

Glenn Research Center (GRC)

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

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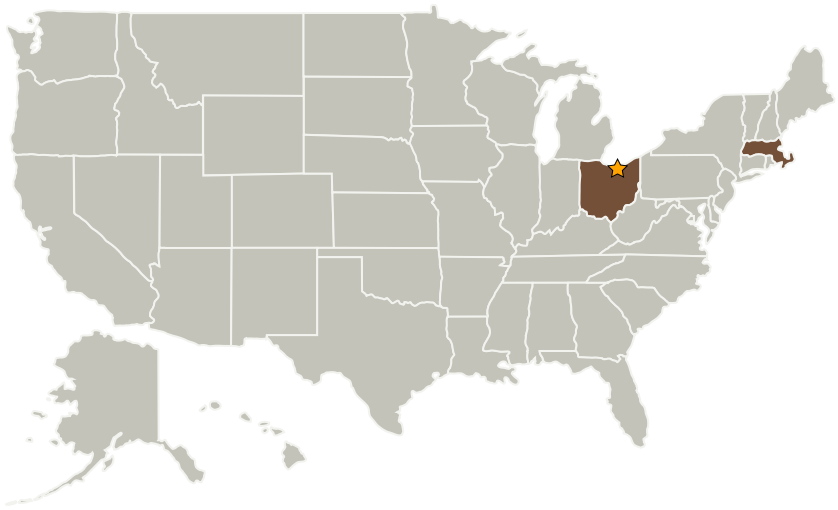
Primary U.S. Work Locations and Key Partners



Organizations Performing Work	Role	Type	Location
★Glenn Research Center(GRC)	Lead Organization	NASA Center	Cleveland, Ohio
Boston Applied Technologies, Inc.	Supporting Organization	Industry Minority-Owned Business	Woburn, Massachusetts

Primary U.S. Work Locations	
Massachusetts	Ohio

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Principal Investigator:

Yingyin K Zou

Technology Areas

Primary:

- TX05 Communications, Navigation, and Orbital Debris Tracking and Characterization Systems
  - TX05.1 Optical Communications
    - TX05.1.6 Optimetrics